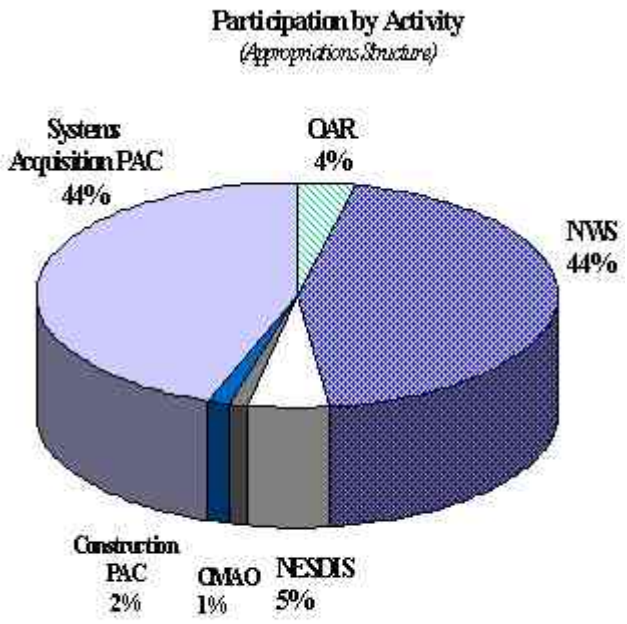
Advance Short-Term Warning and Forecast Services

Total Request: $1,474,441,000

Vision - NOAA's vision for 2005 is to provide significantly improved short-term warning and forecast products and services that enhance public safety and economic productivity to the Nation. NOAA will enhance its ability to observe, understand, and model the environment, and effectively disseminate products and services to users.



Challenge - Our environment has profound effects on human welfare and economic well being. Each year, hundreds of lives and billions of dollars are lost due to severe storms, floods and other natural events that can be predicted minutes to months in advance. NOAA's current ability to predict short-term change is restricted by observations that are incomplete in time and space. This limits the ability to improve basic understanding, and predictive modeling of weather and other natural phenomena. NOAA is committed to improving its observing systems, developing a better understanding of natural processes, and enhancing its predictive models and dissemination systems.

Implementation Strategy - The objectives of this goal are to:

- Sustain modernized weather service operations
- Maintain continuous operational satellite coverage critical for warnings and forecasts
- Strengthen observing and prediction systems
- Improve customer service to the public, emergency managers, the media, and private forecasters.

Benefits - Increasing our understanding of the environment through research and investing in new technologies will provide more accurate and timely weather warnings and forecasts required by the Nation. Improved geomagnetic forecasts will increase efficiencies for satellite operations and communications and electronic power distribution networks. Advanced modeling techniques and more complete observations will reduce uncertainties in hurricane track prediction, saving millions of dollars, and will improve inland flood prediction, saving lives and property. Accurate outlooks of future conditions will provide better information for planning weather sensitive activities over land and ocean. Critical contributions for the Natural Disaster Reduction Initiative will be provided from the research, monitoring and operational program in this NOAA goal.

Improvements associated with the modernized weather services have allowed for huge dividends. A cost-benefit analysis by the National Institute of Standards and Technology estimated economic benefits to the Nation to be about eight times greater than the costs involved. The Nation should realize annual benefits approaching $7 billion from the modernization. It is now time to take full advantage of the modernization.

FY 2000 Accomplishments - The Nation continued to benefit from the NWS $4.5 billion modernization efforts, with improved and exemplary weather forecasting and warning services being provided around the Nation in FY 2000.

Provided Exemplary Services in the February Georgia Tornadoes: During February, NOAA provided tornado warnings from 33 - 59 minutes (three to six times faster than the average tornado warning) for residents in Georgia, enabling citizens to get out of harm's way. The NOAA Weather Radio's tone alert feature was credited with waking people up providing time for them to seek safe shelter.

Provided Support to Wildfires in Southwest and Western U. S.: During the Spring and Summer, NOAA had 14 Incident Meteorologists (IMETS) on site to assist other federal agencies with an increasing number of wildfires. Through July, the National Weather Service (NWS) dispatched IMETS to work the equivalent of 550 days on wildfires. Over 60,000 wildfires have burned nearly 3.5 million acres this year, making this the worst fire season in 30 years.

Unveiled "StormReady" Program: NWS designed a program to help cities, counties, and towns implement procedures to reduce the impact of natural weather disasters. "StormReady" provides clear recommendations for communities to improve their warning and preparedness for hazardous weather operations. Local communities are certified as "Strom Ready" for their jurisdiction by meeting criteria established by the NWS in partnership with federal, state and local emergency management professionals.

Launched Geostationary Operational Environmental Satellite, GOES - L: During May, NOAA launched its newest satellite, GOES - L. GOES satellites are vital to weather forecasting in the U.S. and aide weather forecasters in providing better warnings of severe weather.

- *Launched Polar Orbiting operational Environmental Satellite, NOAA-L*: In September, NOAA launched the second satellite of its newest advanced series of polar-orbiting satellites. This satellite places the second set of advanced microwave instruments in orbit to allow for improved daily global sensing of atmospheric weather and climate parameters in cloudy regions.

  Provided New Weather Products: In response to customer and partner needs, NOAA extended its precipitation guidance products from two to three days and developed a probabilistic winter weather guidance product for snow and ice.

  Installed the new IBM SP SuperComputer: In FY 2000, NOAA installed the new IBM SP SuperComputer and transferred over 126,000 products to the new system.

  Released Public Service Announcement Warning Against Driving Through Flooded Areas: The National Association for Stock Car Auto Racing's Darrell Waltrip and NOAA's NWS teamed up to provide a new public service announcement warning of the dangers of driving on flooded roadways. Floods are responsible for more deaths each year than any other weather-related phenomena, and of these fatalities, about half (more than 50 annually) are caused when people try to drive through flooded roadways.

- *Completed Severe Thunderstorm Electrification and Precipitation Studies (STEPS) Field Program:* From May through July, NOAA scientists joined researchers from about a dozen organizations to study thunderstorms and lightning in the High Plains, with the goal of improving severe weather forecasts. Supercell thunderstorms are considered to be the most dangerous type of storm due to the extreme weather generated, including tornadoes, large hail and flooding.

Key FY 2002 Activities

- Sustain NWS modernized operations
- Provide an adequate preventative and cyclical facilities maintenance program
- Provide operation and maintenance support for 152 fielded Advanced Weather Interactive Processing Systems (AWIPS)
- Continue AWIPS Build 5.0 development activities (3rd year of 3 year effort)
- Continue NEXRAD and ASOS planned product improvement initiatives
- Make final lease payment on the Class VIII supercomputer
- Provide critical infrastructure protection for the NWS Telecommunication Gateway, a critical link in the national and international infrastructure that collects and distributes weather data
- Continue the radiosonde replacement program to ensure critical upper air data
- Continue the procurement, launching, and operation of polar orbiting satellites and the follow-on series of geostationary weather satellites
- Conduct required data assimilation and numerical modeling activities which are vital to the NWS

forecast process

- Continue the national implementation of the Advanced Hydrologic Prediction Service (AHPS) in the Upper Midwest and tributaries within the upper Ohio River Basin
- Perform research to improve the forecast accuracy and lead-time for hurricane tracking and landfall prediction through assessments, analysis of enhanced data sets, and simulations.
- Support the multi-year procurement of spacecraft, launches and associated ground system changes from the current series NOAA K-N of polar-orbiting satellite System (NPOESS), and the Geostationary Operational Environmental Satellite (GOES).
- Establish a Joint Center for Satellite Data Assimilation to accelerate the use of satellite data in numerical weather prediction models.

Key Performance Measures

	1997 act.	1998 act.	1999 act.	2000 act.	2001 est.	2002 est.
Tornado Warnings						
Lead Time (minutes)	10	11	12	10	13	13
Accuracy (percent)	59	66	70	63*	68**	70**
* False Alarm Rate (percent)			72	76*	73**	70**
Flash Flood Warnings						
Lead Time (minutes)	45	52	41	43	45	48
Accuracy (percent)	82	85	83	86	86	86
Winter Storm Warnings						
* Lead Time (hours)			11	9	13	14
* Accuracy (percent)			85	85	86	87
Hurricane Warnings						
* Lead Time (hours)			19	N/A	21	22
Aviation Forecasts (Ceiling/Visibility)						
* Accuracy (percent)			19	15	21	23
* False Alarm Rate (percent)			52	53*	51**	47**
Marine Forecasts (Wind/Wave)						
* Accuracy (percent)			50	50	53	55
Precipitation Forecasts						
* Accuracy of 3-day Forecast (percent)				16	22	24
* Represents new measures						

N/A - represents no landfalling hurricanes in 2000

* FY 2000 Actual performance measures modified due to additional verification and quality control procedures in February, 2001.

** FY 2001 and 2002 Performance measures modified based on actual performance in FY 2000.